### Energy Management Training for K-12 Schools

**Workshop #1: The Business of Energy Management** 

A Tele-Workshop brought to you by:



Colorado Governor's Office of Energy Management and Conservation

*September 21, 2006* 









### The Business of Energy Management

#### **Today's Topics**

- 1. Introduction to Rebuild Colorado and Energy Management Training for K-12 Schools
- 2. Jim Faes, Jefferson County Public Schools
- 3. Jim Carter, Lewis-Palmer School District





### Rebuild Colorado

### Round up the savings...



to get better buildings





### Identifying Opportunities

High energy bills?

**Comfort problems?** 

**Maintenance problems** 

**Aging Equipment?** 



Rebuild Colorado helps schools identify and assess energy-saving projects in buildings, and helps make those projects a reality!





## Rebuild Colorado can help you choose a path that's right for you

High-performance building design?

Performance contracting?

Recommissioning?

Energy management?

Grants & in-house funding?

**Bond** initiative?







## Rebuild Colorado can help you succeed

#### Free Customized Services for You....

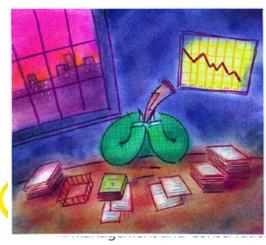
- Engineering study to identify efficiency opportunities
- Energy performance contracting facilitation and engineering support
- Commissioning facilitation to tune up your buildings
- Energy education for all grade levels
- High performance design assistance for better buildings and LEED™ projects
- Energy management assistance and training for improving day-today operations
- Engineering project analysis for bonds or Colorado Department of Education grants
  - *Presentations* to decision-makers



### Call Us When You ...

- ✓ Are strategizing to upgrade your buildings
- ✓ Are planning a new building
- ✓ Are developing projects for capital improvement budgets (internal funds, bonds or grants)
- **✓** Want to use energy savings to pay for projects
- ✓ Want to bring energy costs under control
- ✓ Want to improve comfort and solve maintenance problems





### Your Rebuild Colorado School Team

Linda Smith, OEMC Senior Program Manager John Canfield, Schools Coordinator Peter D'Antonio, Schools Energy Manager Rob Pearson, OEMC Project Assistant





### Energy Management Training

- Comprehensive, step-by-step, nine-month program brought to you by expert energy managers
- Tune in for monthly interactive sessions
- Receive a certification of training documenting your participation
- For: K-12 school district staff including maintenance staff, energy managers, purchasing officials and others responsible for facility maintenance and improvements.





### Rebuild Colorado

## We're here to get you started... and see you through

#### **Contact us:**

303-866-2100 or 800-632-6662

www.colorado.gov/rebuildco rebuildco@state.co.us





### Energy Management

Presented by:

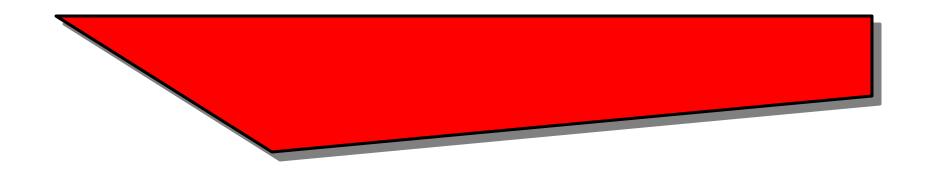
Jim Faes, CEM &

Tom MacDonnell, CEM

Jeffco Schools







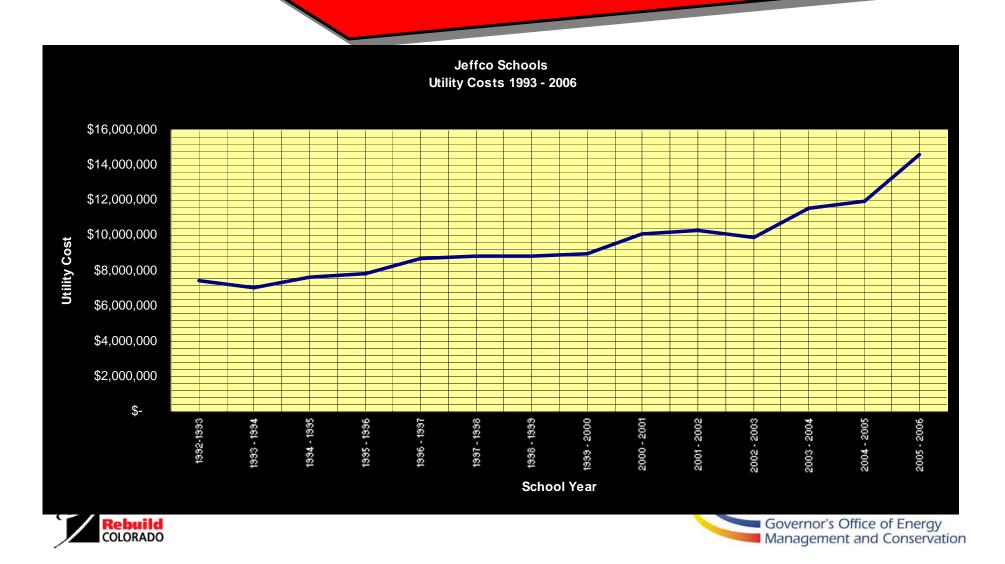
### Why Have an Energy Management Program:

- Re-allocates funding from utility budget to other programs.
- Protects our natural environment through less pollution.
- Involves district personnel and students in a common goal
- Improves the teaching/learning environment.





### Increasing Utility Costs



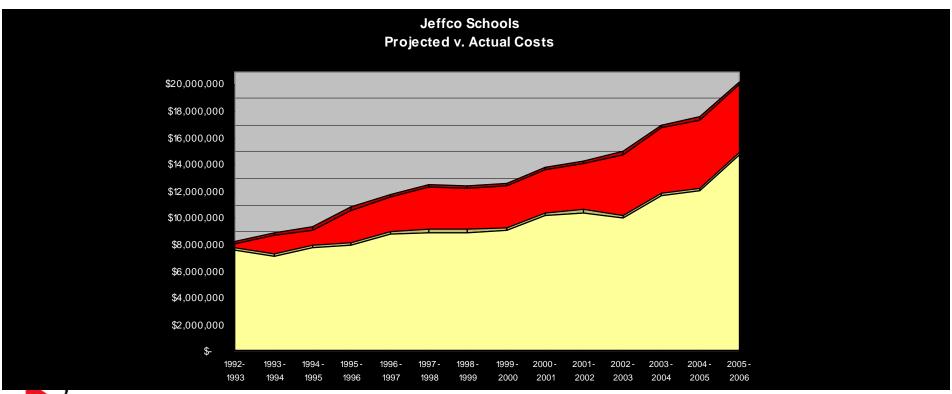
### Environmental Impacts

The United States Environmental Protection Agency estimates that every kilowatt-hour of electricity avoided prevents the emission of 1.5 pounds of carbon dioxide, 5.8 grams of sulfur dioxide and 2.5 grams of nitrogen oxide.





### Cost Avoidance







### Energy Manager's Role

- Create awareness
- Audit utility bills
- Audit buildings
- •Provide support to district departments





### Creating Awareness





### Leadership

## Work with district leadership to create an energy policy and program.

http://jeffcodir.jeffco.k12.co.us/board/policies/regs/ecf-r.html

http://jeffcodir.jeffco.k12.co.us/board/policies/ecf.html





### Conservation Guidelines

- Lighting
- Technology
- HVAC schedules
- Irrigation
- Facility use





### **Involving Others**

- Facility / Custodial Staff
- . Maintenance personnel
- . Cafeteria workers
- Principals /Administrative staff
- . Teachers
- . Students





### How to Involve the Schools

- ☐ Who has the responsibility for the energy program?
- ☐ Create staff awareness
  - All user groups
- ☐ Involve the students
  - National Education for Energy Development Project www.need.org





# Utility Bill Tracking and Auditing





### Billing Errors

- ☐ Estimated readings
- **□** Taxes
- □ Rates
- ☐ Is it an error or mechanical problem?





### Energy Accounting System

- First line defense for out of tolerance utility costs
- Compares current consumption and utility expenses to base year
- Produce an effective reporting system
- Develop an accountability system for energy consumption throughout the district.
- Products
  - EPA Portfolio Manager free!!!

https://www.energystar.gov/index.cfm?c=k12\_schools.bus\_schoolsk

- Utility Manager
- Metrix





### Utility Providers

- ☐ Ensure best rate schedules
- **□** Apply for rebate programs
- ☐ Get appropriate credits
- ☐ Attend training opportunities





## Building Audits





### Energy Audits

Establish a facility auditing system to look for opportunities to save and educate!





### Savings Priority System

- Nighttime and weekend
- Holiday & break schedules
- Before and after school
- During the school day





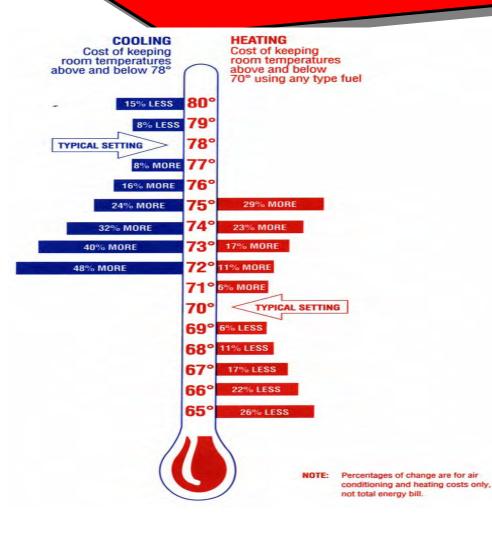
### Auditing Tools

- Thermometer
- Light meter
- Data loggers
- Audit forms
- Miscellaneous hand tools





### Set Point Savings







### Other Resources

- Colorado Association of School District Energy Managers
- Office of Energy Management and Conservation
- EPA Energy Star
- Energy Service Companies (ESCO)





### Summary

- Establish Board Policy
- Set guidelines
- Set goals
- Awareness / training
  - district staff
  - students
  - community
- Audit facilities
- Audit bills

- Ensure Efficient operations
  - during school day
  - before/after school
  - nights/weekends
  - holidays
- Ensure Efficient equipment
  - performance contracts
  - grants/rebates
- Establish Efficient purchases





## Questions?? Comments??





### Thank You!!!





## LEWIS PALMER SCHOOL DISTRICT #38





### Presented by:

Jim Carter

Lewis Palmer Schools





#### WHO WE ARE

- APPROX. 5800 STUDENTS
- COVERING 142 SQUARE MILES
- 1 HIGH SCHOOL
- 2 MIDDLE SCHOOLS
- 5 ELEMENTARY SCHOOLS
- ADMINISTRATION SITE
- AUXILARY SERVICES SITE
- **OVER 750,000 SQUARE FEET**





#### HOW WE BECAME INVOLVED

- BEGAN TO RECOGNIZE THE NEED FOR RESPONSIBLE STEWARDSHIP OF OUR RESOURCES
- LACK OF AVAILABLE FINANCING WAS FORCING UPGRADES BY ATTRITTION
- INVOLVMENT WITH CSDEM
- CONTRACTED FOR TRANSPORT GAS





## PERFORMANCE CONTRACTS





#### WHY

- CAPITALIZE NOW ON FUTURE SAVINGS TO FUND UPGRADES
- PROVIDE RESPONSIBLE STEWARDSHIP TO YOUR PATRONS
- ASSIST IN KEEPING DISTRICTS ENERGY BUDGETS IN BALANCE





#### $\overline{HOW}$

- USE GOVERNOR'S ENERGY OFFICE AS A FREE RESOURCE
- FIND A MENTOR
- MAKE SURE YOU KNOW AND UNDERSTAND THE PROGRAM AND HOW IT WORKS
- INVOLVE ALL DEPARTMENTS
- BASELINE UTILITIES





### WE ENTERED INTO A \$4.4 MILLION PC WITH AN ESCO IN NOVEMBER OF 2002





#### WHAT WE DID

- UPGRADED ALL LIGHTING TO ENERGY EFFICIENT T-8
- CHANGED ALL FAUCETS TO LOW FLOW
- CHANGED ALL TOILETS AND URINALS TO LOW WATER USE
- UPGRADED SOME HVAC UNITS
- BETTER SCHEDULING OF HVAC AND LIGHTING





- ESTABLISHED BETTER PRACTICES
- EDUCATION
- SOFTWARE FOR ENERGY TRACKING
- COMMUNITY USE
- GUARANTEED SAVINGS





#### WHAT WE ACCOMPLISHED

- \$1.3 MILLION REMODEL OF ADMINISTRATION BUILDING
- INSTALLATION OF PILOT PROJECT GEOTHERMAL HEAT PUMP SYSTEM IN ADMINISTRATION
- AIR CONDITIONING IN ELEMENTARY SCHOOL
- ENERGY UPGRADES THROUGH OUT DISTRICT
- ALL PAID FOR USING ENERGY SAVINGS





#### \$\$\$\$\$\$\$\$\$\$\$\$\$

- WE HAVE DOCUMENTED SAVINGS FROM 11/1/2002 THROUGH 1/1/2006 OF \$752,729.88
- THIS INCLUDES A SURPLUS ABOVE THE PAYMENTS OF THE CONTRACT OF \$82,403.00





# PROBLEMS THAT WE HAVE ENCOUNTERED

- STAFF AT TIMES FEELS INCONVIENENCED
- AT FIRST BUY IN WAS DIFFICULT TO ACHIEVE
- EVERYONE HAS DIFFERENT COMFORT LEVELS
- STAFF WANTING TO BRING IN OWN APPLIANCES FOR CLASSROOMS





- LACK OF A DESIGNATED PROGRAM MANAGER
- COMMUNITY USE AGREEMENTS
- SOME CONTRACTOR ISSUES
- CHANGING STAFF HABITS





#### ADVICE ON HOW TO BE SUCCESSFUL

- CONSIDER PERFORMANCE CONTRACTING
- BE PROACTIVE
- ESTABLISH MANAGEMENT PRACTICES
- PROMOTE EMPLOYEE BUY-IN
- PROMOTE COMMUNITY SUPPORT





- EDUCATE STAFF ON GOALS, PROCEDURES, ACCOMPLISHMENTS, HOW TO'S
- TAKE ADVANTAGE OF GOOD PUBLICITY
- BE ABLE TO PROVE RESULTS
- LOOK FOR ALTERNATIVE ENERGY SOURCES





# • Thank you

- Questions??
- Comments??





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